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EIGHT STEPS TO IDENTIFY

Environmental Characteristics and Environmental Influences of Your Organization's Operations

FTA ESMS RESOURCE SERIES

This document is one of several FTA Environmental and Sustainability Management System (ESMS) Resource Series Library documents. For additional information regarding ESMS development, implementation and maintenance, please see the related ESMS resources available from FTA cited at the end of the paper.

IMPORTANT COMPONENTS OF ESMS

An important component in the development and implementation of your organization's ESMS is determining environmental characteristics and associated influences that are part of your system. Characteristics are elements of the activities of your organization, the products that you develop or supply, or the services you provide to your customers or the community that interact with the environment. Environmental influences are positive or negative changes to the environment that include those resulting from the activities you undertake. These environmental characteristics and environmental influences are different for every organization depending upon the defined scope of the ESMS. Your organization needs to determine the environmental characteristics associated with its activities, products, and services that it can control and the environmental influences of those characteristics.

The steps we review in this paper are designed to show the process to identify and focus on actions to address the most important or "priority characteristics." The process begins with identifying your organization's activities, products and services, identifying the characteristics associated with activities, products and services, and identifying the influences resulting from the characteristics. Once the characteristics have been identified, the organization ranks the characteristics based on its own criteria and determines the priority characteristics to focus on and address through action plans.

CAUSE AND EFFECT

Environmental Characteristics vs. Environmental Influences

The relationship between environmental characteristics and environmental influences is one of cause and effect. Simply stated:

- An environmental characteristic is a cause or reason. Environmental characteristics of the activities, products or services that your organization performs or provides interact with the environment (land/water/air).
- An environmental influence is an effect or result the environmental characteristic has on the environment. An environmental influence can be adverse or beneficial.

Water pollution is an example of a characteristic that has an adverse influence from a leaking fuel diesel storage tank. Recycling materials for reuse is an example of a characteristic that has a positive influence on the environment because it reduces the need for landfills. So… because of X (characteristic), Y (influence) happens. This is demonstrated in the examples below.

ENVIRONMENTAL CHARACTERISTIC	ENVIRONMENTAL INFLUENCE
Aboveground storage tanks (gear oil, diesel, used oil, hydraulic oil)	Soil contaminated
Emergency generator emissions	Atmosphere polluted
Equipment washing	Waterway polluted
Welding gases & fumes	Localized air quality compromised
Extended diesel fuel transit vehicle idling	Excessive air pollution resulted
Ineffective training for fertilizers, pesticides and herbicides	Waste improperly disposed
Improper management of hydraulic fluids	Fuel leaked, groundwater contaminated

Now that we have defined the basics for environmental characteristics and environmental influences, we can discuss the process to determine priority environmental characteristics and environmental influences for your organization's operations. The process may be broken down into 8 steps. Those steps are more fully described throughout this document.

The 8 Step Process

1

Step One
ESMS team establishes an assessment team representative of the organization's functional areas.

2

Step Two
Assessment team(s) determines environmental characteristics pertaining to organization's activities, products and services.

3 **Step Three**
Assessment team reviews the environmental characteristics and environmental influences.

4 **Step Four**
Assessment team identifies criteria for determining priority environmental characteristics.

5 **Step Five**
Assessment team ranks the environmental characteristics.

6 **Step Six**
Assessment team submits report to ESMS team and management for approval.

7 **Step Seven**
ESMS and assessment teams communicate priority environmental characteristics to the organization.

8 **Step Eight**
ESMS and assessment teams initiate activities for action plan development and implementation.

STEP 1: Establish an Assessment Team

Establish an Assessment Team
Depending upon the size of your organization, your ESMS team may decide to conduct the assessment on its own, or it may form a separate assessment team which includes representatives from specific operational or functional areas. The main purpose of the assessment team is to identify the characteristics and influences associated with activities, products and services within their designated areas.

The makeup of the team is determined based on the complexity of the activity, product or service associated with your organization's functional or operational areas. Examples of operational or functional areas within an organization can include but are not limited to design and development, finance, vehicle maintenance, legal, transit (fueling, transit parking areas, vehicle washing), training, and procurement.

From these operational or functional areas, the team will (see Step Two) list associated activities, products and services and determine relevant characteristics.

STEP 2: Determine Environmental Characteristics

Determine Environmental Characteristics

The cornerstone for planning your ESMS is determining those environmental characteristics, related to your organization's activities, products and services, that have or can have an environmental influence. Examples of the organization's activities, products and services can include, but are not limited to:

- Design and development of facilities, processes, products and services
- Acquisition of raw materials
- Operational processes, including warehousing
- Operation and maintenance of facilities, assets and infrastructure
- Environmental performance and practices of contractors
- Transportation and service delivery, packaging
- Storage, use and end-of-life treatment of products, waste management, including reuse, refurbishing, recycling and disposal

The assessment team reviews and discusses these activities, products and services of your organization and then identifies the environmental characteristics. Provided below is a list of typical, though not comprehensive, environmental characteristics.

Typical Environmental Characteristics

- Aboveground storage tanks (gear oil, diesel, used oil, hydraulic oil)
- Aerosol cans
- Batteries
- Bio-hazardous wastes and sharps
- Carbon dioxide emission
- Compressed gases
- Degreasers
- Diesel fuel
- Electricity
- Emergency generator emissions
- Engine cleaning machine and filter press
- Equipment washing
- Exhaust fumes
- Fertilizers, pesticides and herbicides
- Fluorescent bulbs
- Fuel consumption - heating
- General trash
- Glass cleaner
- Grease
- Grit chamber and blow down pit cleanout
- High intensity discharge bulbs
- Hydraulic fluid
- Lubricants
- Lead-acid batteries
- Metal recycling
- Natural gas
- Noise
- Office waste paper
- Oil absorbent waste
- Oil filters
- Oil water separator liquid waste
- Oil water separator solid waste
- Oily rags
- Old computer disposal
- Old equipment disposal
- Paint waste
- Parts washers
- Parts washer solvent
- Printer cartridges
- Rechargeable batteries
- Recycled antifreeze
- Refrigerant
- Scrap metal
- Soaps and cleaners
- Spill kits
- Storm water
- Underground storage tanks
- Used antifreeze
- Used oil
- Used tires
- Virgin antifreeze
- Wash waste water
- Windshield washer fluid
- Welding gases & fumes

It is not unusual to have duplicate environmental characteristics from various operations, nor is it unusual to have a very long list during your first review. As you review the environmental characteristics, you can merge the activities together. For example, the characteristic of managing used oil may appear in activities associated with product storage tanks, used oil storage tanks, vehicle servicing, or reused processes.

STEP 3: Review Characteristics and Identify Influences

Review Environmental Characteristics and Identify Environmental Influences

The assessment team lists the environmental characteristics and identifies known and potential environmental influences pertaining to activities associated with determined operational areas.

The following matrix is an example that demonstrates the process of formally listing activities, products, and services; environmental characteristics; and influences.

Evaluation of Environmental Characteristics and Environmental Influences Matrix

Characteristic Identifier	Activity/Product/ Service	Environmental Characteristic	Environmental Influence
A1	Aerosol Usage	Releases air emissions	Air pollution
			Hazardous particulates
A2	Sign shop waste from sign making	Polypropylene shavings	Air pollution
			Hazardous particulates
A3	Painting	Used paint disposal	Groundwater and soil pollution at landfill, air pollution
		Fumes, storage/ paint booth	Air pollution
		Spills	Ground and surface water, soil, air pollution
		Disposing-paint can, used brushes and rollers	Air, water, soil
A4	Transporting chemicals	Fuel, diesel, gasoline and other petroleum-based chemicals	Air, water, soil
		Pesticide/herbicide/ fertilizer	Air, water, soil

Evaluation of Environmental Characteristics and Environmental Influences Matrix

A5	Idling vehicles	Exhaust, noise, fuel	Air & noise pollution, fuel consumption
A6	Operating Equipment (Hydraulic/engine, oil, bucket truck, small engine, tractors, etc.)	Fuel emissions, exhaust, emission, spills	Water, groundwater, air pollution
A7	Disposing of old batteries	Used batteries	Soil & groundwater pollution at landfill
A8	Using lubricants	Lubricant volatile organic compounds	Groundwater
A9	Cleaning the paint sprayers	Degreasers	Water pollution, VOC emissions
A10	Fueling equipment	Fuel, containers, spills	Groundwater, air pollution, soil
A11	Using graffiti remover	Chemicals	Groundwater, soil at landfill
A12	Disposing of electronics	Scrap metal, scoreboards, bulbs	Soil & groundwater pollution at landfill
A13	Maintenance of grease traps	Fats, oils and greases	Water and soil

STEP 4: Identify Criteria

Identify Criteria for Determining Priority Environmental Characteristics

Once the characteristics have been identified, the organization then determines the priority characteristics to focus on and address through action plans.

Your organization first sets the criteria for classifying priority environmental characteristics. Environmental assessment criteria relate to the environmental characteristic (e.g., type, size, frequency) or the environmental influence (e.g., scale, severity, duration, exposure, likelihood, consequence). Note, the method and criteria selected should provide consistent results.
The assessment team establishes a scoring system based on the evaluation criteria to rank the lists of characteristics. This is further explained and displayed in the table below.

EXAMPLE: Criteria for Evaluating Importance of Environmental Characteristics

The table below shows an example of a scoring system for team members to use when ranking the environmental characteristics based on the identified criteria such as likelihood or occurrence and the importance of the influence. Following the team assessment, the team agrees on a final number or score. Note that a ranking scale of 1–5 is established in advance, with a score of 1 indicating a low influence and a score of 5 indicating a high influence.

Criteria for Evaluating Importance of Environmental Characteristics

Score	Likelihood of Occurence	Consequence (Impact to Environment, Legal, Cost)
1	**Low** (improbable, very little chance to occur)	**Low** (improbable, very little impact)
2	**Moderate** (unlikely, not likely but not impossible)	**Moderate** (unlikely, not likely but not impossible)
3	**High** (possible, fairly likely to occur)	**High** (possible, fairly likely)
4	**Very High** (probable, more likely to occur than not)	**Very High** (probable, more likely than not)
5	**Extremely High** (probable, will likely occur)	**Extremely High** (probable, likely)

NOTE: *The determination of priority environmental characteristics and influences is calculated by averaging the scores based on the criteria related to likelihood and consequence defined in this table.*

STEP 5: Rank the Environmental Characteristics

Rank the Environmental Characteristics

The assessment team determines a cutoff score to address the highest ranked or priority environmental characteristics. In the examples shown below, the characteristics of the activities, products and services with a score of 2.5 or higher are identified as Priority.

The table below shows the full list of activities, products and services, environmental characteristics, environmental influences, and scoring/ranking.

Characteristic Identifier	Activity/Product/Service	Environmental Significance Impact and Priority				
		Scale of Influence	Influence Severity	Occurrence Probability	Influence Duration	Average score (out of 5)
		1 5	1 5	1 5	1 5	
A1	ACTIVITY/PRODUCT/SERVICE: Filling, storing and removing used oils from vehicles. Stored in UST. Oil is burned for heat. CHARACTERISTIC: **Used Oil** INFLUENCES: Air, soil, surface water and groundwater pollutant if discharged.	5	2	2	2	2.75
A2	ACTIVITY/PRODUCT/SERVICE: Lubricant engine oil (SAE 30) — stored in UST. Transmission, air compressor, differential and hydraulic. CHARACTERISTIC: **Fresh Oil** INFLUENCES: Air, soil, surface water and groundwater pollutant if discharged.	4	4	2	2	3
A3	ACTIVITY/PRODUCT/SERVICE: Fuel for fleet, stored in UST. CHARACTERISTIC: **Diesel** INFLUENCES: Air, soil, surface water and groundwater pollutant if discharged.	3	2	2	3	2.5
A4	ACTIVITY/PRODUCT/SERVICE: Replacing fluorescent bulbs as needed, and replacing light ballasts. Bulbs are stored for shipments as universal waste. CHARACTERISTIC: **Used Lamps/Ballasts** INFLUENCES: Hazardous waste from breakage and air, soil, surface and groundwater pollution associated with landfill.	2	2	2	2	2

A5	ACTIVITY/PRODUCT/SERVICE: Parts cleaners, paints, coating, lubricant, etc. CHARACTERISTIC: **Aerosol Cans** INFLUENCES: Air, soil, surface water and groundwater pollutant if punctured or ruptured due to extreme temperature.	2	2	2	2	2
A6	ACTIVITY/PRODUCT/SERVICE: Changing new and used tires — tires leased; changed as needed. CHARACTERISTIC: **Used Tires (Revenue/Non-revenue)** INFLUENCES: Air, soil and groundwater pollutant associated with landfills.	3	1	1	1	1.5
A7	ACTIVITY/PRODUCT/SERVICE: Oil/water separator pumped two times per year. Pumping out OWS, wash bay drains, steam bay drains — removed as hazardous waste. CHARACTERISTIC: **Oil Water Separator** INFLUENCES: Soil and groundwater pollution from discharge associated with OWS (catastrophic failure of the OWS).	3	2	2	2	2.25
A8	ACTIVITY/PRODUCT/SERVICE: Batteries used in flashlights, other hand-held devices. CHARACTERISTIC: **Batteries (Disposable)** INFLUENCES: Air, soil and groundwater pollutant associated with landfills.	2	1	1	1	1.25
A9	ACTIVITY/PRODUCT/SERVICE: Lead-acid batteries used in buses and other Authority vehicles. CHARACTERISTIC: **Batteries (Revenue/Non-revenue)** INFLUENCES: Soil, surface water and groundwater pollution associated with landfill.	2	2	1	3	2

A10	ACTIVITY/PRODUCT/SERVICE: CHARACTERISTIC: **Used Filters (Air), Belts** INFLUENCES: Soil, surface water and groundwater pollution associated with landfill.	2	1	1	2	1.5
A11	ACTIVITY/PRODUCT/SERVICE: CHARACTERISTIC: **Used Filters (Oil)** INFLUENCES: Soil, surface water and groundwater pollution associated with landfill.	2	1	1	2	1.5
A12	ACTIVITY/PRODUCT/SERVICE: Office heat & A/C units (including various TPSS for streetcar). CHARACTERISTIC: **Electricity** INFLUENCES: Energy consumption.	1	1	1	1	1

It is the priority environmental characteristics that receive a score greater than the 2.5, as shown in the table below, that the example organization will ultimately develop targets and actions to eliminate or reduce the associated influences. The environmental characteristics of activities, products, and services that scored below a score of 2.5 would be evaluated and monitored routinely to ensure they stay below the threshold of becoming priority.

Characteristic	Score and Rank	
Fresh Oil	3.0	#1
Used Oil Storage	2.75	#2
Diesel Fuel Storage	2.5	#3

STEP 6: Submit Reports

Submit Report to ESMS Team and Management for Approval

After identifying, scoring, and ranking environmental characteristics and environmental influences, the ESMS assessment team meets with management to report results. The purpose of the communication is to ensure that the organization's senior management are all aware and in agreement prior to communicating and disseminating information to the organization's personnel and those doing work under its control.

STEP 7: Communicate Priorities

Communicate Priority Environmental Characteristics to the Organization

Once priority environmental characteristics are determined, your organization needs to communicate them throughout the various levels and functions of the organization, as well as to those external to the organization including contractors, legal entities, and auditors. Applicable methods of communicating can include company-wide meetings, meetings with departments or functions, training pertaining to the environmental characteristics, contractor orientation, posting environmental characteristics and environmental influences throughout the facility and on the intranet.

STEP 8: Initiate Activities

Initiate Activities for Action Plan Development and Implementation

After priority environmental characteristics and environmental influences are determined, your organization needs to determine the extent of control it is able to exercise over each and the extent to which it chooses to exercise such control.

ESMS and assessment teams recommend personnel with the appropriate knowledge, skills and background to develop and implement an action plan to management. The action plan is developed to implement the actions as determined by your organization to address the priority characteristics and eliminate or reduce the influence or the impact on the environment. The action plans require the support of management and the resources and authority provided to accomplish the task.

An action plan is designed to define the activities necessary for the organization to exercise control over the priority activity. The plan identifies the responsible personnel, the resources necessary to accomplish the task (i.e. time, money, materials), goals and targets for the priority item, identification of tasks and subtasks, a timetable for tasks and subtasks to meet goals and targets and a final report and verification that actions are implemented and effective.

Additional information and guidance pertaining to developing and implementing action plans can be found in the FTA ESMS online course cited below.

Additional Resources

- FTA ESMS website
  Provides links to webinars, brochures, and resources from the ESMS Resource Series.
- EPA website
  Provides information and resources related to Environmental Management Systems (EMSs).
- International Organization for Standardization information, publications and products.
- American Public Transportation Association (APTA) sustainability resources
- Center for Environmental Excellence by AASHTO
- FTA ESMS Introductory Online Course